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AN AERIAL SURVEY TO DETECT SPRUCE BUDWORM
DAMAGE ON THE NICOLET, AND MAPLE DIEBACK
ON THE OTTAWA AND NICOLET NATIONAL FORESTS, 1979

by

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INTRODUCTION

An aerial sketchmap survey was conducted on the Nicolet National Forest's Eagle River and Florence Ranger Districts and on the Ottawa National Forest's Iron River District on June 27-28, 1979.

Maple mortality and dieback were reported by personnel on both Forests and an evaluation of the 1979 conditions was requested. Dieback symptoms include gradual twig and branch dieback from the crown downward, production of epicormic branches, and, in severe cases, tree death.

The Nicolet National Forest also requested an aerial survey for defoliation and mortality caused by spruce budworm, Choristoneura fumiferana (Clemens). Erickson (1973) reported 600 acres of spruce budworm-caused defoliation on the Nicolet National Forest in 1973. Since then, the budworm population has increased and spread. Spruce budworm surveys were also conducted in 1974 (Fowler) and 1975 (Anderson).

OBJECTIVES

This survey was made to determine the acreage and location of the current spruce budworm defoliation and to delineate maple dieback areas.

METHODS

A Cessna 206 was used in a low level 100 percent sketchmapping aerial survey of three districts. Flight lines were drawn north and south at two mile intervals on USDA Forest Service National Forest maps with a scale of 1/2-inch to the mile. Personnel from both National Forests assisted in the survey. Observations were made between 8:30 a.m. and 3:00 p.m. at 1,000 feet above ground while flying 90-100 mph.

Areas of spruce-fir mortality, visible medium to severe spruce-fir defoliation (30-100 percent loss including old and new foliage), and maple dieback were plotted on the forest maps (Figs. 1, 2, 3). Color codes were used to distinguish between budworm defoliation and maple damage.

Ten areas of spruce budworm defoliation were ground checked to accurately confirm marking of medium to severe defoliation and mortality areas. At least 30 areas aerially detected, plus several stands District personnel said contained dead or dying maple, were ground checked.

RESULTS

Spruce Budworm

Three hundred and thirteen separate spruce-fir defoliation areas totaling 25,690 acres were detected on the Nicolet National Forest. Medium to severe defoliation and/or mortality occurred on 14,260 acres of the Eagle River District and 11,430 acres on the Florence Ranger District (Figs. 1 and 2 and Tables 1 and 2). Spruce budworm defoliation was medium to severe on 80-90 percent of spruce-fir stands throughout both Districts, with most mortality occurring on the southern half of the Eagle River District.

Maple Dieback

We recorded 135 possible maple dieback sites with 3 or more trees affected (Figs. 1, 2, 3). One hundred eighteen sites were detected on the Iron River District, Ottawa National Forest, and 17 were detected on the Eagle River and Florence Ranger Districts, Nicolet National Forest.

DISCUSSION

There were no primary pathogens or insects found during the ground checking of the maple dieback areas nor from the samples collected. Due to the visual symptoms found in the field, the lack of any primary pests, and the history of severe drought in the area, we believe the maple dieback has been caused by drought induced stress.

The spruce budworm areas ground checked concurred with the aerial observations of moderate to severe defoliation. A Forest Service map (1/2-inch to the mile) depicting areas of maple dieback was sent to the Ottawa National Forest. The Nicolet National Forest also received the same type of map depicting areas of maple dieback and spruce budworm defoliation.

Aerial surveys for spruce budworm will be flown on both National Forests in 1980. We recommend that both National Forests consider establishing cutting priorities for the salvagable acreages.

REFERENCES

- Anderson, Bruce C.
1975. Spruce budworm aerial survey Nicolet National Forest.
NA S&PF, St. Paul Field Office Report S-20-75.
- Erickson, Glen
1973. Spruce budworm defoliation, 1973, Nicolet National Forest.
NA S&PF, St. Paul Field Office Report S-9-73.
- Fowler, R. F.
1974. Spruce budworm defoliation, 1974, Nicolet National Forest.
NA S&PF, St. Paul Field Office Report S-6-74.

Table 1.--Acres of medium to severe spruce budworm defoliation by stand on the Eagle River Ranger District, Nicolet National Forest

Stand No.	Acres	Stand No.	Acres	Stand No.	Acres	Stand No.	Acres
1	51	50	51	103	128	157	25
2	153	51	25	104	25	158	358
3	76	52	25	105	76	159	51
4	76	53	128	106	25	160	102
5	76	54	51	107	25	161	128
6	384	55	51	108	128	162	128
7	51	56	76	109	25	163	25
8	76	57	230	110	25	165	25
9	76	58	51	111	51		
10	384	59	128	112	230		
11	25	60	51	113	204		
12	179	61	153	114	102		
13	128	62	128	115	204		
14	51	63	153	116	76		
15	25	64	25	117	51		
16	25	65	102	118	819		
17	25	66	25	119	102		
18	76	67	76	120	51		
19	25	68	25	121	460		
20	51	69	204	122	25		
21	76	70	256	123	179		
22	204	71	102	124	25		
23	25	72	51	125	25		
24	51	73	179	126	25		
25	51	74	250	127	179		
26	51	75	25	128	230		
27	230	76	51	129	25		
28	51	77	153	134	76		
29	128	78	25	135	51		
30	51	81	76	136	51		
31	102	82	51	138	25		
32	102	83	51	139	51		
33	102	84	76	140	25		
34	25	85	153	141	51		
35	25	86	25	142	25		
36	51	87	76	143	25		
37	25	88	51	144	51		
38	409	89	51	145	25		
39	51	90	128	146	51		
40	76	91	25	147	51		
41	25	92	76	148	25		
42	25	93	76	149	25		
43	25	94	51	150	256		
44	25	95	76	151	51		
45	25	96	51	152	25		
46	76	97	25	153	25		
47	25	98	537	154	76		
48	51	99	76	155	76		
49	25	102	76	156	51		

Table 2.--Acres of medium to severe spruce budworm defoliation by stand on the Florence Ranger District, Nicolet National Forest

Stand No.	Acres	Stand No.	Acres	Stand No.	Acres	Stand No.	Acres
1	51	59	102	116	51	179	25
2	102	60	25	117	102	180	76
3	76	61	25	118	51	181	51
4	25	62	153	119	128	182	25
5	153	63	153	120	51	183	281
6	153	64	51	121	204	184	25
7	25	65	128	122	25	185	25
8	128	66	153	123	25	186	51
9	179	71	51	124	25	187	76
10	25	72	25	125	51	188	76
11	51	73	25	126	153		
12	76	74	25	127	25		
13	128	75	128	128	25		
14	128	76	51	129	25		
23	51	77	76	130	25		
24	128	78	51	131	76		
25	179	79	25	132	51		
26	25	80	51	141	25		
27	25	81	51	142	25		
28	332	82	25	143	25		
29	76	83	25	144	25		
30	153	84	76	145	51		
31	25	85	102	146	51		
32	51	86	51	147	25		
33	51	87	102	148	128		
34	102	88	25	149	25		
35	76	89	51	150	102		
36	25	90	51	151	128		
37	25	91	25	152	128		
38	51	92	25	153	102		
39	51	93	51	154	102		
40	25	94	25	155	76		
41	76	95	51	156	281		
44	153	96	153	157	153		
45	25	97	76	158	51		
46	25	98	25	159	102		
47	76	99	51	160	51		
48	230	100	25	161	51		
49	25	101	76	162	25		
50	51	102	76	163	25		
51	51	103	51	164	51		
52	25	104	51	165	51		
53	102	105	102	166	51		
54	51	106	25	174	51		
55	256	112	76	175	25		
56	384	113	51	176	76		
57	25	114	51	177	128		
58	25	115	128	178	51		

Figure 1.--**NICOLET NATIONAL FOREST**
EAGLE RIVER RANGER DISTRICT

Spruce Budworm Defoliation & Maple Dieback - 1979

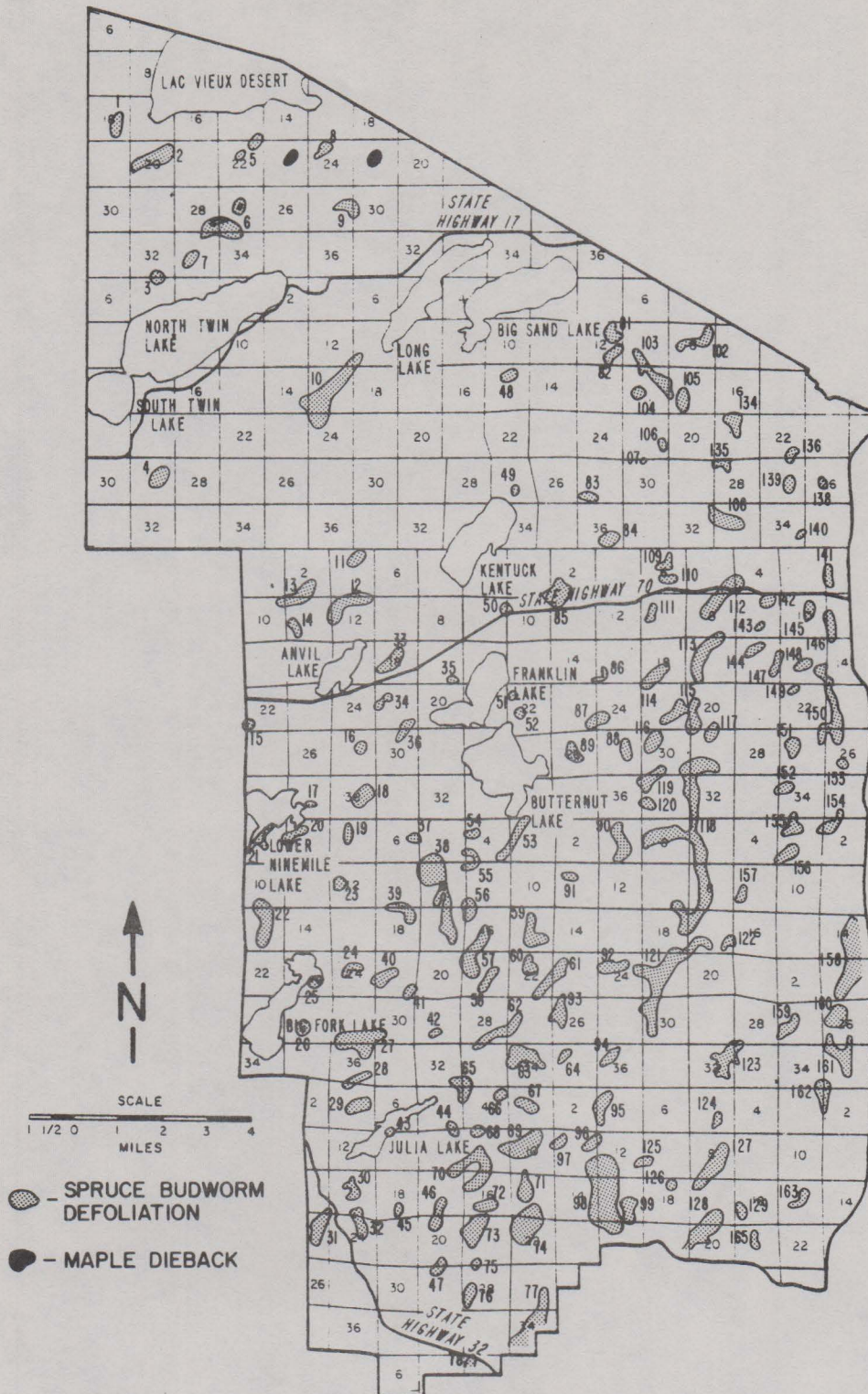


Figure 2.--**NICOLET NATIONAL FOREST**
FLORENCE RANGER DISTRICT

Spruce Budworm Defoliation & Maple Dieback - 1979

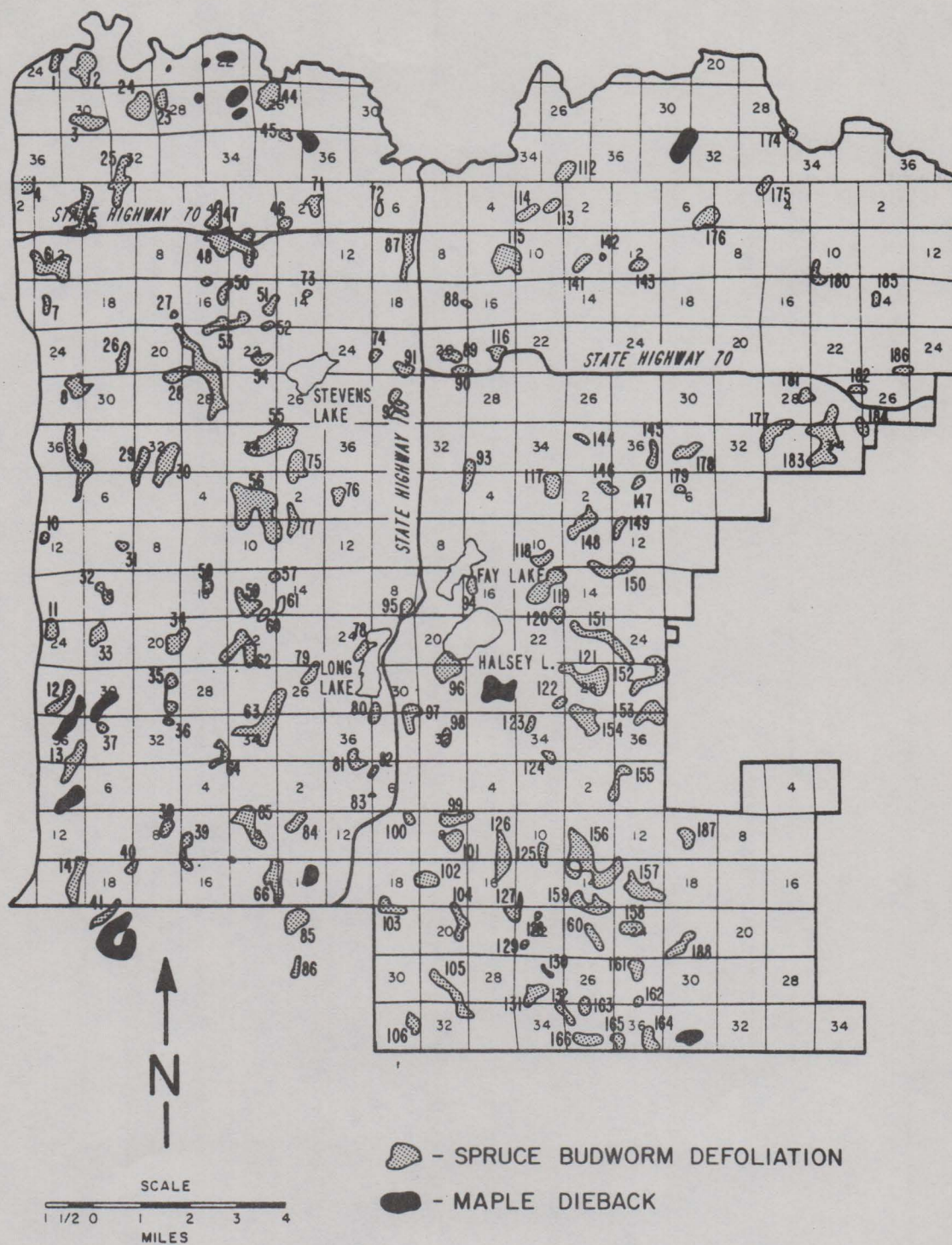


Figure 3.--**OTTAWA NATIONAL FOREST**
IRON RIVER RANGER DISTRICT
Maple Dieback - 1979

